

# Data Network Environment Assessment



## Wide Area Transport Electronics

### ➤ *Current Equipment Overview*

#### ✓ *SCaDA Networks*

This type of network primarily uses proprietary equipment integrated into the operational machinery.

#### ✓ *Mainframe Controller Network*

The Mainframe Controller Network uses Racal Datacom analog leased line modems. If the quantities of inactive circuits are as they appear, there is a large quantity of cards in these systems that are no longer required, but may still be under a lease agreement. Much of this equipment is no longer manufactured and the manufacturer is expected to discontinue repairing these units in the near future.

#### ✓ *DRMS Network*

The DRMS Network uses Nortel Networks (formerly Bay Networks, Wellfleet, Synoptics) router equipment to provide connectivity between sites. The Water and Sewerage Department, however, uses Cisco equipment. This equipment ranges from high capacity backbone routers at the large sites that act as aggregation points for other sites, to low capacity remote site routers.

#### ✓ *Video*

The City is presently using PictureTel video conferencing stations, which were purchased under a grant.

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### ➤ *Equipment Providers, Leases and Contractual Obligations*

#### ✓ *City Owned Equipment*

The City presently owns the proprietary SCaDA equipment and the large backbone routers aggregation at the sites.

#### ✓ *Leased Equipment*

The City leases a large amount of its data communications equipment from RJ Networking, Inc. A list of the components includes, the Racal modems for mainframe connectivity, the network routers (except the backbone routers), the CSU/DSUs that connect the routers to the WAN lines, and a large portion of the network electronics within the buildings. The value of the lease for the WAN components is \$826,452 annually, including maintenance.

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### ➤ *Network Management*

The City owns two network management platforms, Optivity (a product specific to the Nortel Networks equipment) and WhatsUp (a non vendor specific package from IP Switch). Optivity is not presently in use on the network and WhatsUp is monitoring the Fire Department network and the 10 major buildings to provide failure notification. For most of the City's network, proactive performance monitoring and failure analysis does not appear to be a staffed function at this time. Additionally, the City is lacking a central device with an overall view of the DRMS enterprise network sharing the present operational status.

### ➤ *Issues of Concern*

- ✓ The present Racal equipment that supports the mainframe connectivity for the Police and payroll applications will likely no longer be supported by the manufacturer in the near future. Since this is a technology that is outdated, finding alternate equipment may be difficult and expensive. Presently, the cost of the leased equipment and line charges to support these applications is \$741,384 annually.
- ✓ Leasing of the majority of LAN data equipment may result in paying a premium for this equipment.
- ✓ The City has tools for network management, however, these tools are not being used to their fullest, and as a result, there is no historical trending of Ameritech circuit failures or network performance.
- ✓ The lack of power backup facilities at the network hub (the Municipal Center) to provide power to the network equipment and maintain an acceptable operational temperature puts communications at risk of failure in the event of a power outage.
- ✓ At the new lease rates, the City is spending more annually on the lease and maintenance of a router than the purchase price of a new router. Since many of these routers were part of the previous lease, the City will likely pay for these devices 4 to 6 times by the end of the present lease.

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## Summary and Observations

### ➤ ***Converged Network***

Up to this point, the City has built networks for each type of data transport, video, LAN Data, SCaDA, and Mainframe Controllers. In some cases, technology has required separate infrastructures, even for connecting multiple pieces of equipment in the same sites. The technology is now available for a single network transport to provide most of this connectivity converged over a faster transport. The City's network architecture clearly suggests that reliable, redundant systems are important to the operation of several departments' networks. An approach similar to the architecture of Long Distance Carrier networks may be a future consideration. These are high capacity and carry multiple types of traffic, but they also use technologies such as ATM and SONET to provide alternate data paths that automatically reconfigure if a link fails. The City is already using ATM technology within several buildings, and this equipment will accommodate connectivity to these high performance networks. There may be key buildings such as the Municipal Center, Police Headquarters, and PLD that require multiple diverse building network entrances to reduce the risk of network outages. Some systems, such as those that control power distribution, traffic signals, and the water or sewer systems, may be best served remaining as simple independent networks.

### ➤ ***Back-Up Power***

Having a backup source of power and facilities to properly cool electronics in the event of a power outage should be a future consideration.

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## Summary and Observations

### ➤ ***Network Management***

The City should consider a more proactive role in network monitoring, management and trend documentation and a system that provides an overall view of the entire network status.

### ➤ ***Mainframe Controller Network***

Due to its age and availability status, analog Mainframe Controller network equipment will become increasingly difficult to maintain and obtain spare parts for, making it difficult and expensive to maintain reliable connectivity for the terminal based applications. This network supports mission critical applications, Police dispatch, Fire Dispatch, the State law enforcement database, and the City payroll application. It seems apparent that the City will need to either rewrite the applications to allow them to work with PCs on a LAN, or replace the application. Moving to an environment that uses the DRMS Network, which is already connected to these sites, to transport data would save the City \$741,384 annually in connection and equipment related expenses.